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Absorption Mechanisms for Ultra-Intense Laser-Plasma and Solid Target Interactions*

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We present a comprehensive study of various absorption mechanisms present for the interaction of an ultra-intense laser interacting with an overdense plasma, which may be produced by shining the laser onto a solid. We concentrate on the absorption mechanisms that result in hot electrons. We will also mention absorption mechanisms that may occur in the underdense plasma in front of the solid, assuming the presence of a pre-pulse. Other absorption mechanisms, such as ion acceleration and shock formation will also be studied. Applications to the fast ignitor fusion scheme will be discussed.

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